VolumeCheck

Volume Inspection System

Overview

VolumeCheck Inspection System

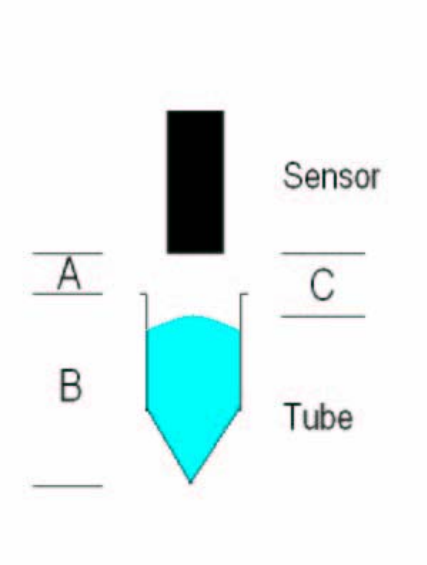
- Automates quality control of sample volumes
- Processes up to 60 racks per hour
- Robotically scans SBS formatted well plates and tube racks
- Output file is volume or measured distance between sensor and liquid level
- Easy-to-use software for creation of calibration look up tables for labware

VolumeCheck Attributes and Applications

- Quality control instrument for production and research labs
- Helps track and measure the presence or absence of samples
- Low-cost bench top lab automation instrument
- Automates volume detection in uncapped well plates and tube racks
- Significant labor cost savings and significant decrease in error rates via automation of manual tasks associated with tracking sample volume
- Easily integrates with existing robotics and LIMS systems via ActiveX controls

VolumeCheck Technology

VolumeCheck uses a non-contact sensor to measure the distance from the sensor to the surface of the sample liquid in a tube or plate well (distance **C** in sensor diagram.) The VolumeCheck returns volume and distance data.



The VolumeCheck's sensor has readability in the 0.1mm range. However, due to variations in labware and samples, the VolumeCheck system accuracy will vary. Samples that are 'well behaved' (no air bubbles in sample or droplets on inside wall of a tube), should provide sensor-to-liquid distance data that can be interpreted as sample volume in the +/- 10µl range.

VolumeCheck system resolution may be influenced by:

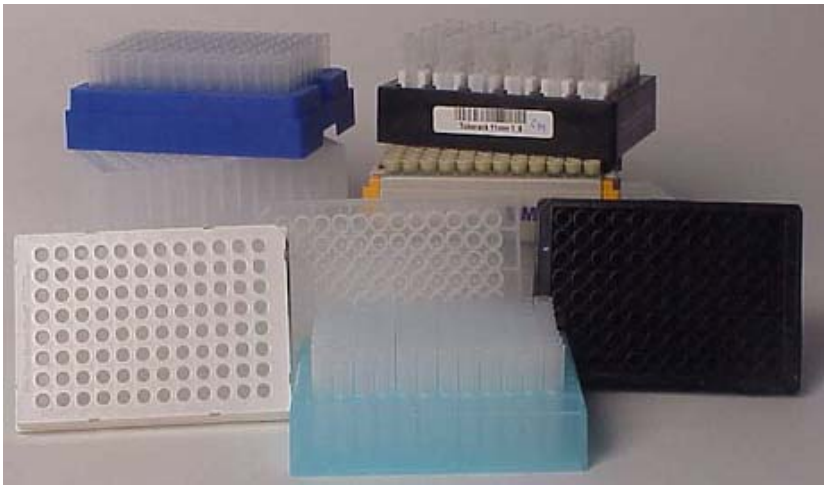
- Differences in labware such as conical, v-shaped, or flat-bottom well plates and tubes
- Droplets on the wall of a tube or well
- Air bubbles in sample
- Plate-to-plate dimensional variations

To determine sample volume, a calibration plot of sensor-to-liquid distance and sample volume is required. Data for this calibration plot is obtained by incrementally dispensing and measuring the sample volume. Within the labware and sample limitations described, the VolumeCheck can provide a very consistent robotic method for inspection of well plates and tube racks for sample volume.

VolumeCheck Consumable Compatibility

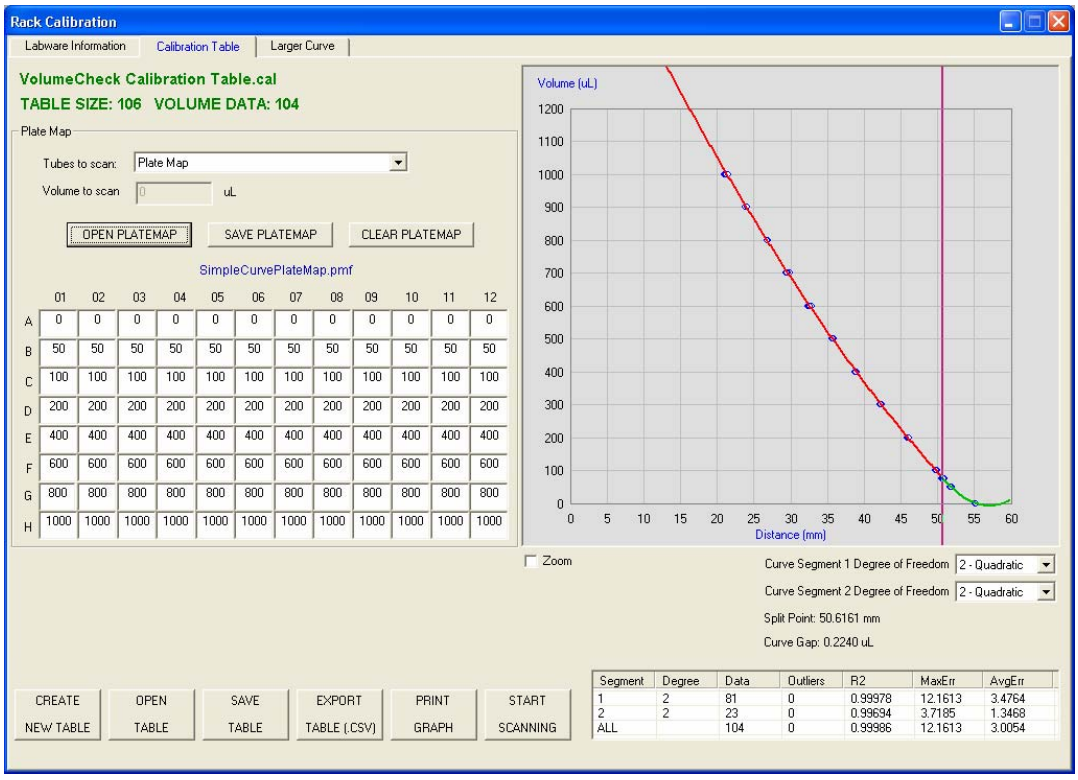
The VolumeCheck instrument is compatible with a wide variety of labware in the SBS format.

- PCR Plates
- 2D bar coded tube racks
- Deep Well blocks
- Shallow well plates
- Vials less than 52mm in height

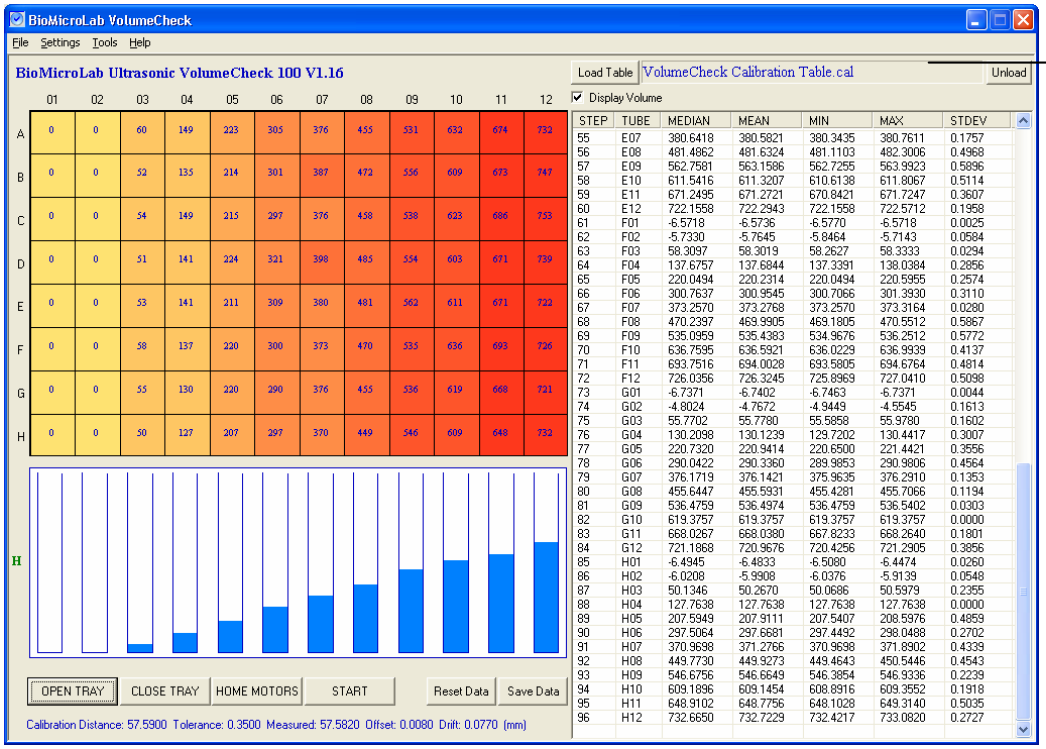


VolumeCheck Plate Processing Steps

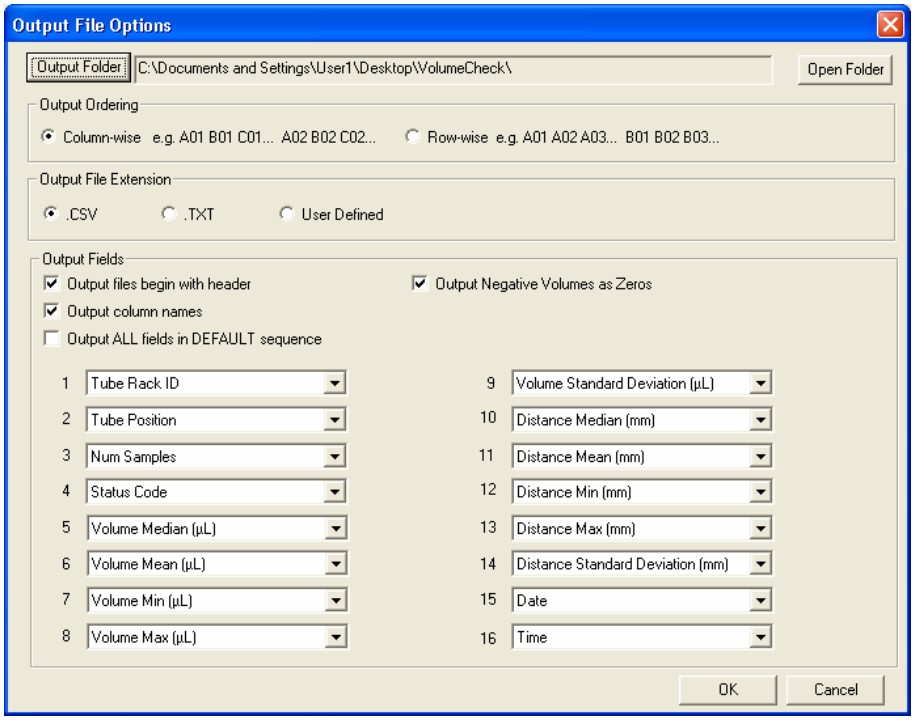
- Customer creates calibration plots using the VolumeCheck calibration software tools for each type of labware to be used (Figure A)
- Customer sets display parameters for controlling the visual data results
- Plates are individually scanned, named via linear barcode scanner, and output to destination folder (Figure B)
- VolumeCheck software exports a .csv file with measured values and/or volume results for each well position. Types of data exported: Volume, Mean, Median, Minimum, Maximum, Standard Deviation (Figure C)
- VolumeCheck software generates log files



Example of Customer Look Up Table (Figure A)



VolumeCheck Main Processing Screen (Figure B)



Output File Options (Figure C)

Summary of VolumeCheck operation with well plate

The VolumeCheck instrument measures sample volume using an ultrasonic distance sensor to measure sample height in a tube or well. Using a calibration plot of measured sample heights of known volumes allows the VolumeCheck to determine sample volume in uncapped labware. The accuracy of the VolumeCheck is dependent on the calibration plot data, sample characteristics, and repeatability of labware dimensions. Typically, the VolumeCheck will measure within +/- 10µL of the sample volume for 1000µL tube or well.

VolumeCheck Sample Data:

Procedure

- Sample volume is dispensed into well plate
- VolumeCheck software scanned the well plate to create the sample height to volume calibration plot
- Calibration plot is selected and well plate is scanned
- VolumeCheck returns sample volume data

Summary

1000µL well plate with buffer

- Measured volume within 1µL to 8µL (1% to 6%) of known sample volume

Results for 1000µL well plate

Labware: 1000µL well plate
Sample: Buffer
# of data points in calibration plot: 8 (Note: A larger number of data points is recommended)

Well location 1000µL well plate / buffer	Sample Volume	Measured Volume	Difference of sample volume and measured volume	% difference of sample volume and measured volume
C05	0	0.3	0.3	-
C06	50	47.3	2.7	5.4%
C07	100	102.4	2.4	2.4%
C08	200	200.5	0.5	0.2%
C09	500	497.8	2.2	0.4%
C10	800	796.4	3.6	0.4%
C11	900	900.9	0.9	0.1%
C12	1000	992.5	7.5	0.7%

VolumeCheck Models

VolumeCheck 50 List Price: $19,995.00

- One 96 tube rack or 96 well plate capacity robot
- **Three** minute processing time per plate

VolumeCheck 100 List Price: $24,995.00

- One 96 tube rack or 96 well plate capacity robot
- **45 seconds to one** minute processing time per plate

System requirements:

The VolumeCheck requires a Windows 2000/XP (512 RAM) computer for operation.

VolumeCheck Options:

- On-site installation and training (optional): $1,995.00
- DELL computer pre-configured with VolumeCheck software: $1,895.00
- 1D Handheld Linear Bar Code Reader: $495.00
- VolumeCheck ActiveX controls: $1,995.00
- Well plate and tube rack adapters: $500.00 (call for quote)

Typical VolumeCheck Product Configuration

- VolumeCheck robotics platform with VolumeCheck Software
- VolumeCheck User Guide and Quick Start Manual
- Windows 2000/XP Computer

VolumeCheck Instrument Specifications

VolumeCheck 50	VolumeCheck 100	VolumeCheck 100LV
Low Speed Sensor • 3 minute to scan 96 well plate or tube rack	**High Speed Sensor** • One minute to scan 96 well plate or tube rack	**High Speed Sensor** • One minute to scan 96 well plate or tube rack
Applications • Research • QC tasks	**Applications** • Research / QC tasks • Production monitoring • Automated processing	**Applications** • Research / QC tasks • Production monitoring • Automated processing
Labware support • Well plate • Deep well plate • Tube rack (96 tube)	**Labware support** • Well plate • Deep well plate • Tube rack (96 tube)	**Labware support** • Tubes, vials, or well plates up to 70mm in height • Tubes, vials, or plates with SBS or larger footprint
Low volume well plates or tubes may require an optional adapter bracket.	Low volume well plates or tubes may require an optional adapter bracket.	Non-standard well plates or tube racks may require an optional adapter bracket.

Options
- Shallow Well plate adapter
- Tube rack adapter
- Non-standard plate / tube adapter
- ActiveX Controls

Requires
- Windows XP/Vista computer, 512K RAM, one USB port

Specifications
- Dimensions: 10.5" H x 10.3" W x 17.0" D
- Weight: 27 lbs.
- Electrical: 110-220 VAC 50/60Hz